



Delivery Systems for Instructional Improvement¹

Ted Ward

Thank you, Dr. Stevens, Dr. Martinson. I appreciate being here. I think that you are right: this is one of those cases when a speaker does need an introduction. I think the function of “this man needs no introduction” is primarily related to helping people come to the opinion, whether well founded or not, that everyone else in the group really knows him. In this case this would not be the fact. My involvement with Special Education has been fairly recent and my involvement with administration has been rather slight. And with those two particulars in my credentials, I’m sure that I was rather a questionable choice for keynote speaker for this particular session.

Nonetheless, I have some interests and some concerns that apparently are very similar to those of the people in this group, and I trust that together we will be able to explore these. Then perhaps we can set the scene for more careful and more deliberate studies beyond this particular talk as you continue in the conference.

Being a user of media has its advantages, in terms of better communications; but it certainly has its disadvantages in terms of the management of space. I have a great deal of sympathy for teachers who find one way to avoid using instructional devices by claiming that they never work. Even when the projectors do work, the extension cord is missing and if the extension cord is there, its a three-pole and the outlet is a two-pole and if there is an adapter, some kid has put bubble gum in it, at least two weeks before.

This early in the morning, I’m not very strong on the bright, witty humor. (I’m not too much any other time of the day, either, but you don’t know that.) So I thought I’d do my best and try to start out by finding something funny, even though I really had to dredge for it. So I worked over the last newspapers before I left home, figuring if I couldn’t say something funny, I could at least say something current. And I was really rather in trouble because the day that I picked to look at the news, you just couldn’t find much that was the kind of thing that you’d want to start with on a bright day in a bright conference. And I couldn’t even make too much sense out of Peanuts; but I stuck the newspaper in my briefcase just hoping that my West Coast perception would be keener than my Great Lakes perception, and when I got about halfway out here, I finally found the item that I needed. I decided if we couldn’t have anything funny, anything current, we could at least have something consoling.

I came across this item and I think it’s *à propos*. “The Postmaster General said Monday in Detroit: The Nixon administration is well along the path of restoring the society shaken and battered by discord and violence. I think we’re going to survive the youth revolution. After all, we created it.” Now, I’ll let you decide for yourselves if that is consoling, profound, or just funny.

Several years ago, when Lou Alonso and I wrote the proposal for the Instructional Materials Center that we developed at Michigan State, it was our motive and intention—reflected in the proposal—that we find some ways to bring together the forces in the behavioral sciences in order to provide more promising solutions for the problems of instructional services. Specifically we wanted to find a way to combine some of the interests and efforts in the Colleges of Education that were

¹ Ted Ward. Delivery Systems for Instructional Improvement. Address to the National Conference for Special Education Administrators. University of Oregon, Eugene, Oregon, May 5-8, 1970

directed toward the matter of instructional systems design along with the forces that had been there, long-standing, in the area of Special Education in order to really accomplish something in the educational procedures for handicapped children. The Instructional Materials Center that the Bureau for Education of the Handicapped established at Michigan State has been operating since its establishment among that first group of center. Our first job was to get some insight and understanding about what was going on, what was the nature of instructional materials centers, and what was the concept of delivery systems at work in the educational world as it was then.

And we made some interesting discoveries through looking over the field. We came to some conclusions that I'd like to share with you. We discovered that the delivery of instructional resources was largely at the state of development represented as a pipeline model, wherein great ideas and innovations were somehow funneled into a pipeline. The pipeline serves as the delivery system to the classroom. Looking more closely, we discovered some things that weren't very encouraging. Some of the things being shoveled into this system were gadgets and unproven bright ideas. Then we made a more careful analysis and we discovered that there was imbedded in this model a concept of how to make it work. First of all you scrape up stuff, you shovel it in, you shove it along, and you pray. This seemed to be rather typical of what was being done with instruction delivery systems.

There seemed not to be much real thought, at least within the areas we were surveying, about what were the roles and functions within delivery systems for instructional resources. Perhaps this was an over-condemnation, and of course we are willing to share in the condemnation because some of us haven't moved the whole process along all that much since then!

As we start off this conference, where we are being asked to look at new concepts of organization and delivery systems specifically for instructional services for handicapped children, it might be useful for us to take a look at some of the things that a systems view of education has allowed us to do and some of the consequences of taking a systems view. Most of you are well ahead of me with reference to some of the things that systems design means for educational administration, so I will only attempt to add some observations and propositions about systems design as it relates to instructional services. Instructional systems concepts bring into instructional services several distinct consequences. Some of these have great value. I have listed seven of them: they are described following in order of increasing significance. In fact, the first two are least consequential and may border on the facetious.

1. One of the consequences of systems thought has been to provide one more way to talk about things we don't really understand. Since it is much easier to learn systems jargon than it is computer jargon, it turns out to be a handy for many people to get instant erudition. There really are only about eight words you need to talk the "systems talk"; there are about fourteen needed to talk "computer talk." In a sense, then, the problems that have been addressed to instructional systems design have been problems that we really don't know too much about. This has served one valuable function. If you really feel that you don't understand enough about the variables in a particular problem, you say, "Let's do a systems analysis." It may very well be that this makes us a little more honest about what we can understand and what we can't understand. I think for example, of the current Office of Education project to develop models of teacher education elementary teachers. You're likely familiar with these ten models, one of which was built at Michigan State. Every one of these ten projects uses, in one way or another, a systems design concept. Systems thinking allows us to use a fresh terminology to deal with problems that we now we don't understand. Whether or not this produces more understanding is debatable.

2. The second thing that is produced by systems thinking in education is an anxiety, deeper anxiety over the dehumanization of education. In explaining systems concepts in reference to education, I try

to illustrate the difference it makes to think of education in systems terms. In systems education for example, the word “input” is used to represent that which comes into the system to be processed, and goes out as “output” of the system. It makes a difference to think of students as input. And, of course, this sounds almost inhuman, but it does make a difference to planning and to getting and using feedback. When we use words like “feedback”, it sounds as if the processes are so mechanical that there may be no room for people and human feelings. Of course, one of the most threatening things about the use of systems terminology in education is the tendency of systems terminology not to use terms like “teacher”. In systems terms, teachers are indicated as “human components in the processing system”, instead. And teachers can get shaken up over that! You use behavioral criteria to define and defend learning, and you end up with definitions like “learning is changed behavior”. All of these terms and concepts have a certain dehumanizing tendency and we should be careful not to defend that tendency. It hardly seems fair, however, for systems engineers to take all the blame for dehumanizing education in our era. There are other forces that have been at it so much longer!

3. The third element or consequence begins to get into those that we might call distinct advantages: emphasis on specification of objectives. Whether we’re talking what happened because of teaching machines, what’s happened because of programmed instruction, or any of the other innovative trends, the emphasis on objectives has certain values in education planning. An emphasis on instructional objectives tends to embarrass the system into really looking at itself in terms of the consequences it is attempting to achieve. If an institution has been allowed to develop without continuous and particular re-examination of its objectives, a review of the objectives of the institution will tend to nudge the institution in rather healthy sorts of ways. When I say “embarrass” and “nudge” the institution, I refer to the most constructive sense: to make it aware of the extent to which it has let goals, and purposes, and objectives become subordinate to maintenance of the status quo and institutional “stability.” An emphasis on objectives also produces clarity, or at least verbal clarity. It allows a re-examination of values and focuses on products. This seems to be very appropriate in a day when we have become very process-oriented almost to the exclusion of concern about the products of the processes.

4. Another consequence of systems thinking in education is an emphasis on feedback. It is timely for us to have an emphasis on feedback, in this era when educational institutions and their decision-makers are having to learn to listen. The capacity of an institution and its leaders to listen to feedback is healthy. Those of us in the human institutions must become deeply aware of the value of learning to listen. Learning to listen and to pay attention to evaluative data for other than the obvious and simple uses (making judgmental statements—that this kid has achieved and that kid hasn’t) could make a great difference in the way we approach instructional management. If we saw the system being on test, not just the kids being on test, then I think we might see something very significant happen. The more we focus on feedback, the more we become aware of the role and function of feedback in the management and refinement of the system, and the more we become aware that the value of evaluative data is not simply a matter of telling whether or not a child has achieved, but telling whether or not the system has achieved for that child.

5. The fifth element is the reduction of exclusiveness of education and educators. Probably by virtue of being ostracized by other of our academic colleagues, and possibly because of our own rather independent nature as educators, we tend to be willing to accept a separated status from the rest of the academic community (and in the public school world with reference to the rest of the intellectual community). One of the consequences of systems thinking has been that of identifying our problems and our mechanisms with those problems and those mechanisms that exist in quite a wide range of other fields of human pursuit. I think the most clear example of this is with reference to the field of

communication. For many years people in communication have been talking about “sender”, “receivers”, “messages” and “change.” They have been talking about “feedback”, “signals”, and “noise.” They have been talking about what they call “experiences in perception” which produce “meaning”, which then produce “feedback messages”, which then are received by the “original sender”, which then produce “experiences” and “perceptions” in the “sender” which result in “message adjustment” and “message retransmission.

A communications model, which is invariably a systems mode, becomes a point of common identity with those in the professional field of communication. Information systems models describe basic functions in instruction; an educator can fill in the equivalent terms from education and describe that particular part of the instructional system which is concerned with the communication of information in special reference to the classroom and the learner. And, of course, feedback messages may or may not be received, a challenge both to educators and to communicators.

One of the consequences, then, of systems thought, has been to help us to draw appropriately from other disciplines, particularly in the behavioral sciences. Models and concepts, particularly models and concepts of information-flow and information-processing, allow us on the one hand to think another way about our problems, perhaps to think a better way about our problems, and at the same time to produce a sense of identity with colleagues in other academic pursuits.

6. The sixth consequence of systems thought is the providing of a tool for taking logical account of the pieces and parts that go together and affect each other in terms of educational goals. Systems analysis is a conceptual implement for more carefully looking at the many, many elements that go together to constitute an educational enterprise. Educational administrators for years have been aware of what today might be called inter-component relationships. And perhaps we get from systems analysis only a new vocabulary to put on old ideas. Probably it goes further: it makes not just terminological but functional differences to have systematic procedures by which to identify and relate the components that are functioning in any particular communication or education enterprise, and to be able to identify and relate these components, their function, their interactions with one another and the processes that they produce. It keeps us from having quite so many blind spots.

7. The seventh point observes that one consequence of applying systems thought to education is the providing of a tool for breaking out of traditional models and preconceptions. This is not to say that systems analysis is the only tool for breaking out of traditional models and preconceptions (there are even various sorts of drugs that allow one to do this). The heuristic aspects of systems analysis and design, if taken seriously, allows one to escape, at least experimentally, the ever-rigid boundaries of experience which have produced preconceptions about the nature of things. Such heuristic models can permit a break with that most important of all constraints, the notion that we have to be “realistic”. Any system design, in the final analysis, attempts to be realistic. But it emphasizes being realistic after thinking through the problem, rather than bringing in the constraints of supposed “realism’s” before really examining the nuances of the contemporary situation.

We have reviewed here the consequences of systems thought in education. I have emphasized consequences rather than processes and procedures for two reasons: first, I can give you this list of consequences from one man’s point of view without so much danger of retreading old ground. Second, this approach may encourage those who haven’t yet to get into some of the excellent literature dealing with systems concepts. One small booklet which has been released recently by the Government Printing Office was written by Walter LeBaron. The name of it is terribly long, as you might expect of this sort of publication. “Systems Analysis and Learning Systems in the Development of Elementary Teacher Education Models”. LeBaron examined the ten projects in teacher education

mentioned earlier, to evaluate them for the Office of Education. In order to assure understanding of his report, he prepared a little primer. This little primer is a much needed review of systems thought as it relates to educational planning and administration.

Administrators in general and administrators of Special Education in particular are encouraged to read this brief book to get a view of systems thought as it relates to education and also to learn what the OE has initiated in the matter of new approaches to the training of elementary teachers. (The resulting projects may have considerable impact on all of teacher education in the future).

The matter of delivery systems for instructional services is a particularly intense concern to those of us who have been developing and operating Instructional Materials Centers and Regional Media Centers for the field of Special Education. There are some 18 units in this large network, now called the Special Education Instructional Materials Network and coordinated by a CEC branch under contract to OE. We have each focused on the matter of delivery systems and we have been allowed and encouraged by federal support to engage in a certain amount of evaluation and even more trial-and-error.

We can first observe that a delivery system is not merely a pipeline. (The first image presented earlier, was of a pipeline—a sharp contrast with what we are trying to build.) Nor is a delivery system a mechanical utility. It is not something which is created, set into motion and expected to continue to exist. A delivery system is a continuous interaction among six sets of people: innovators, evaluators, communicators, decision makers, re-trainers and implementers. A system view cuts through the stereotypic roles and functions (such as “teacher” and “principal”) in order to account for functions that are fundamental to the system. One principal might function as an evaluator, communicator, and decision-maker, and another principal might function as a communicator and re-trainer. Many teachers function as implementers. Breaking away from the status-role labels in favor of more functional labels, we arrive at this sort of proposition: *a delivery system is an interaction among six sets of people (above) or six functions played by various people; a delivery system is an orderly set of procedures to identify, test, inform, decide, adapt, adopt (or reject) new or altered educational procedures.*

A delivery system for special education must arise from a focus on instructional procedures, their components and the support mechanisms that they require. A delivery system typically must relate multiple sources to multiple targets. Especially for instructional resources in special education use of a single-source model is a strategic error.

For example, a Regional Instructional Materials Center cannot be seen as an adequate single source. Instructional Materials Centers serve as a collective mechanism linking multiple sources and multiple targets. Such a center draws selectively from the multiple sources each one individually and delivers to one or more of the multiple targets through one or more of the appropriate functions being played by particular people.

Sources may be particular classrooms while other classrooms may be targets. Sources may be R&D labs or, for other matters, R&D labs may be targets. Classical and fixed concepts such as “classrooms” and “teachers” and “administrators” are re-conceptualized in terms of goals and functions of the delivery system.

Beyond the issues of procedures for dissemination there are issues of values. In our work at the Regional IMC, we have been trying to raise value questions over the whole area of delivery systems. It is not professionally responsible to operate free of concern of integrity. Honest dissemination cannot be based on forces of influence and manipulation that transcend or circumvent the responsible decision-maker’s role. Dissemination is the process of making a decision-maker aware of and critical of (in terms of his or her own values) the kinds of changes implied by the particular information.

Studying instructional resource delivery systems raises questions such as these: Where are the major sources of ideas, procedures, and materials? Some of these are classrooms and teachers; where

are they? Some of these are R&D centers; where are they? Some of these are developmental projects; where are they? Some of these are commercial sources; where are they? These might seem to be easy questions, but it is surprising how hard it is to get exhaustive answers in this day of diverse efforts and sprawled activities. Particularly in special education, knowing what all is going on is hard enough to say nothing of the question about what is worth knowing about.

Questions related to dissemination are also of the “How?” sort. Listening, testing, and filtering input are basic to the linkage, functions. Instructional materials centers must be in the business of testing materials in terms of effectiveness in producing learning in children.

Many times we operate on the naive assumption that if something is a better way, it sells itself—because after all, everyone is interested in a better way. Not all teachers are interested in a better mouse trap. In fact, it’s not safe to assume that all teachers are interested in better instruction! Teachers and administrators operate within personal and corporate reward systems. What are they? What “turns them on”? To what do they relate?

What training is needed by implementers? It does not good to deliver materials and procedures if the personnel are not trained in means of assuring implementation. The “What” questions also need to be answered. What are the system characteristics? The many questions of this sort systems engineers refer to as problems of environment. What are the over-all constraints within which the particular procedure of material is going to have to function?

To review, what are the forces or procedures that have significant probability for improvement of learning? And what are the data that we have to deal with? Data about learners, their values, their needs, their capabilities. In the mating of these data there emerges a logic for identifying practices, procedures, and instructional materials that would make a valuable difference. An effective linkage between source and target depends on orderly, identifiable functions serving to identify, test, inform, decide, adapt and adopt. The evaluative feedback loop and the recycling of the functions assures vitality and relevancy. The “pay-off” is at the local level where the primary responsibility for personnel and instructional materials rests. Here is the delivery system’s culmination in the instructional experience itself, resulting in learning for handicapped children in association with other children—and in relationship to other elements in the society.